AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) A method that predicts a result produced by a section of code in order to support speculative program execution, the section of code including a plurality of program instructions, the method comprising:

executing the section of code within a program using a head thread, wherein executing the section of code produces the result;

before the head thread produces the result, generating a predicted result to be used in place of the result;

allowing a speculative thread to speculatively execute subsequent code within the program using the predicted result, wherein the subsequent code follows the section of code in an execution stream of the program; and

after the head thread finishes executing the section of code,

checking a read bit, wherein the read bit indicates whether a field within a data region associated with the section of code has been read by the speculative thread, and, if so

advancing the current time in the time dimension of the system, and

determining if a difference between the predicted result and the result generated by the head thread affected execution of the speculative thread;

20   if the difference affected execution of the speculative thread, performing a

21   rollback operation for the speculative thread to undo actions performed by the

22   speculative thread; and

23   if the difference did not affect execution of the speculative thread,

24   performing a join operation to merge state associated with the speculative thread

25   with state associated with the head thread.

1   2 (Canceled).

1   3. (Original) The method of claim 1, wherein determining if the difference

2   affected execution of the speculative thread involves determining if the

3   speculative thread accessed the predicted result.

1   4. (Original) The method of claim 1, wherein determining if the difference

2   affected execution of the speculative thread involves determining if the predicted

3   result differs from the result generated by the head thread.

1   5. (Original) The method of claim 1, wherein generating the predicted

2   result involves looking up a value based upon a program counter for the program.

1   6. (Original) The method of claim 5, wherein generating the predicted

2   result involves additionally looking up the value based upon at least one

3   previously generated value for the result.

1   7. (Original) The method of claim 5, wherein generating the predicted

2   result involves performing a function on the value.

1   8. (Original) The method of claim 1, wherein executing the section of code

2   involves performing one of:

3   a method invocation to execute the section of code;

4   a function call to execute the section of code; and

5   a procedure call to execute the section of code.

1   9. (Original) The method of claim 1, wherein the section of code is a body

2   of a loop in the program, and the result is a loop carried dependency for the loop.

1   10-11 (Canceled).

1   12. (Currently amended) An apparatus that facilitates predicting a result

2   produced by a section of code in order to support speculative program execution,

3   the section of code including a plurality of program instructions, the apparatus

4   comprising:

5   a head thread that is configured to execute the section of code within a

6   program, wherein executing the section of code produces the result;

7   a prediction mechanism that is configured to generate a predicted result to

8   be used in place of the result before the head thread produces the result;

9   a speculative thread that is configured to speculatively execute subsequent

10 code within the program using the predicted result, wherein the subsequent code

11 follows the section of code in an execution stream of the program;

12   a determination mechanism that is configured to determine if a difference

13 between the predicted result and the result generated by the head thread affected

14 execution of the speculative thread;

15   a checking mechanism that is configured to check a read bit, wherein the

16 read bit indicates whether a field within a data region associated with the section

17 of code has been read by the speculative thread;

4

18   a time advancing mechanism that is configured to advance the current time

19   in the time dimension of the system; and

20   a joining mechanism that is configured to merge state associated with the

21   speculative thread with state associated with the head thread if the difference did

22   not affect execution of the speculative thread; and

23   wherein if the difference affected execution of the speculative thread, the

24   apparatus is configured to perform a rollback operation for the speculative thread

25   to undo actions performed by the speculative thread.

1   13 (Canceled).

1   14. (Original) The apparatus of claim 12, wherein the determination

2   mechanism is configured to determine if the speculative thread accessed the

3   predicted result.

1   15. (Original) The apparatus of claim 12, wherein the determination

2   mechanism is configured to determine if the predicted result differs from the

3   result generated by the head thread.

1   16. (Original) The apparatus of claim 12, wherein the prediction

2   mechanism is configured to generate the predicted result by looking up a value

3   based upon a program counter for the program.

1   17. (Original) The apparatus of claim 16, wherein the prediction

2   mechanism is configured to generate the predicted result by additionally looking

3   up the value based upon at least one previously generated value for the result.

1   18. (Original) The apparatus of claim 16, wherein the prediction

2   mechanism is configured to generate the predicted result by performing a function

3   on the value.

1   19. (Original) The apparatus of claim 12, wherein the section of code

2   includes one of, a method, a function and a procedure.

1   20. (Original) The apparatus of claim 12, wherein the section of code is a

2   body of a loop in the program, and the result is a loop carried dependency for the

3   loop.

1   21-22 (Canceled).

1   23. (Currently amended) A computer-readable storage medium storing

2   instructions that when executed by a computer cause the computer to perform a

3   method that predicts a result produced by a section of code in order to support

4   speculative program execution, the section of code including a plurality of

5   program instructions, the method comprising:

6   executing the section of code within a program using a head thread,

7   wherein executing the section of code produces the result;

8   before the head thread produces the result, generating a predicted result to

9   be used in place of the result;

10   allowing a speculative thread to speculatively execute subsequent code

11   within the program using the predicted result, wherein the subsequent code

12   follows the section of code in an execution stream of the program; and

13   after the head thread finishes executing the section of code,

14   checking a read bit, wherein the read bit indicates whether a

15 field within a data region associated with the section of code has

16 been read by the speculative thread, and, if so

17   advancing the current time in the time dimension of the

18 system, and

19   determining if a difference between the predicted result and

20 the result generated by the head thread affected execution of the

21 speculative thread;

22   if the difference affected execution of the speculative thread, performing a

23 rollback operation for the speculative thread to undo actions performed by the

24 speculative thread; and

25   if the difference did not affect execution of the speculative thread,

26 performing a join operation to merge state associated with the speculative thread

27 with state associated with the head thread.

1   24 (Canceled).